AMENDMENTS TO THE CLAIMS

1-20 (canceled).

21. (currently amended): A method of calibrating a multi-section tuneable laser to a specific frequency, the method comprising the steps of:

a) measuring output values from the laser as a function of coarse tuning currents of the laser,

b) forming a first discrete matrix ~~of~~ from said output values from the laser, the first discrete matrix being defined by an optical characteristic of the output of the laser at specific determining tuning currents, and

~~b)~~

c) processing the first discrete matrix so as to determine stable operating points within the first discrete matrix, the stable operating points defining specific frequencies where the laser may be operated.

22. (previously presented): The method as claimed in claim 21 wherein the output values from the laser are measurements indicative of the characteristics of the laser, wherein the characteristics include at least one of:

a) the output power of the laser,

b) the wavelength of the laser,

c) the SMMR of the laser, and

d) the linewidth.

23. (canceled).

24. (previously presented): The method as claimed in claim 21 wherein the first discrete matrix may be viewed graphically as a plane of values relating to the output power of the laser at specific controlling tuning parameters.

25. (previously presented): The method as claimed in claim 21 wherein the step of processing the first discrete matrix includes the steps of:

a) defining regions within the first discrete matrix where an edge or discontinuity is present, and

b) determining points which are bounded by discontinuities or edges, the points determined representing stable operating regions for the specific tuning parameters.

26. (previously presented): The method as claimed in claim 25 wherein the step of defining regions within the first discrete matrix where an edge of discontinuity is present is performed by effecting an edge detection on the matrix values, the edge detection effecting the formation of a processed matrix set of values, the processed matrix set of values having values indicative of whether an edge is present.

27. (previously presented): The method as claimed in claim 25 wherein the step of defining regions within the first discrete matrix where an edge of discontinuity is present is performed by effecting an edge detection on the matrix values, the edge detection effecting the formation of a processed matrix set of values, the processed matrix set of values having values indicative of

whether an edge is present such that the edge detection is effected by one or more of the following steps:

a) processing the first discrete matrix using a filter algorithm in a direction substantially equivalent to the direction of mode jumps of the laser output,
b) determining a set of maximum points within the filtered matrix,
c) determining a set of minimum points within the filtered matrix,
d) establishing a set of maximum and minimum pairs,
e) determining the difference between the maximum and minimum of each pair so as to provide a plurality of difference values, and
f) thresholding the difference values determined such that those values greater than a certain threshold value is defined as an edge within the matrix.

28. (previously presented): The method as claimed in claim 25 wherein the step of defining regions within the first discrete matrix where an edge of discontinuity is present is performed by effecting an edge detection on the first discrete matrix values, the edge detection effecting the formation of a processed matrix set of values, the processed matrix set of values having values indicative of whether an edge is present such that the edge detection is effected by one or more of the following steps:

a) processing the first discrete matrix using a filter algorithm in a direction substantially equivalent to the direction of mode jumps of the laser output,
b) determining a set of maximum points within the filtered matrix,
c) determining a set of minimum points within the filtered matrix,
d) establishing a set of maximum and minimum pairs,

e) determining the difference between the maximum and minimum of each pair so as to provide a plurality of difference values, and

f) thresholding the difference values determined such that those values greater than a certain threshold value is defined as an edge within the matrix wherein the thresholding is performed using the value of the mode jump parameter as a threshold value.

29. (previously presented): The method as claimed in claim 25 wherein the step of defining regions within the first discrete matrix where an edge of discontinuity is present is performed by effecting an edge detection on the first discrete matrix values, the edge detection effecting the formation of a processed matrix set of values, the processed matrix set of values having values indicative of whether an edge is present such that the edge detection is effected by one or more of the following steps:

a) processing the first discrete matrix using a filter algorithm in a direction substantially equivalent to the direction of mode jumps of the laser output,

b) determining a set of maximum points within the filtered matrix,

c) determining a set of minimum points within the filtered matrix,

d) establishing a set of maximum and minimum pairs,

e) determining the difference between the maximum and minimum of each pair so as to provide a plurality of difference values, and

f) thresholding the difference values determined such that those values greater than a certain threshold value is defined as an edge within the matrix wherein the thresholding is performed using the value of the mode jump parameter as a threshold value wherein

the value of the mode jump parameter selected is selected by selecting a sequence of values and selecting the value which provides the best result.

30. (previously presented): The method as claimed in claim 2 1 wherein the step of determining stable operating points within the matrix set of values is effected by performing a distance map operation on the processed matrix set so as to determine distances between adjacent edges and selecting those points which are in the center of the region bounded by the edges.

31. (currently amended): The method as claimed in claim 21 comprising the step of determining whether the determined stable operating points represent the optimum stable operating points by:

a) dilating the set of stable operating points by one pixel so as to widen edges, thereby forcing the edges to join where gaps exist,
b) determining whether more than one operating point is in each dilated bounded region, ~~and~~
c) if more than one operating point is found in the region above it measuring the frequency of the laser at these points, and
d) determining whether the difference between the measured frequency of the laser and the mode jump spacing is within a predetermined value and, if it is within the value averaging the plurality of operating points to provide a single operating point within that bounded region or, if it is not within that predetermined value, allowing for a plurality of points within that region.

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32. (previously presented): The method as claimed in claim 2 1 comprising the repetition of the one or more of the preceding steps at different tuning parameters so as to provide a plurality of matrices, each matrix being indicative of a set of operating points for a particular set of tuning parameters and the linking of operating points from different matrices so as to form a continuous tuning region.

33. (previously presented): The method as claimed in claim 21 comprising the repetition of the one or more of the preceding steps at different tuning parameters so as to provide a plurality of matrices, each matrix being indicative of a set of operating points for a particular set of tuning parameters and the linking of operating points from different matrices so as to form a continuous tuning region wherein the linking of points from different matrices is effected by joining points that meet the criteria that a point from a first matrix and a point from a second matrix are joined if the point from the second matrix has a larger front and back current but these currents are within a predetermined distance value of the two operating points.

34. (previously presented): The method as claimed in claim 21 comprising the repetition of the one or more of the preceding steps at different tuning parameters so as to provide a plurality of matrices, each matrix being indicative of a set of operating points for a particular set of tuning parameters and the linking of operating points from different matrices so as to form a continuous tuning region wherein the frequency of each operating point is measured and those operating points that are adjacent and have a frequency difference within a predetermined range are joined.

35. (previously presented): A method of calibrating a tuneable laser comprising the steps of:

a) measuring the output power of the device as a function of the coarse tuning sections,

b) determining an edgemap or discontinuities in the measured data,

c) defining points which are in-between the edges found,

d) repeating steps (a)-(c) for different values of fine tuning current, and

e) joining points so as to form continuous lines, the lines being determined as a function of a fine tuning current where the wavelength tuning of the laser is continuous, and being indicative of regions of continuous tuning of the laser.

36. (previously presented): The method as claimed in claim 35 further including the step of: interpolating the lines found in step (e) to obtain the actual currents to achieve the desired output frequencies of the device.

37. (previously presented): The method as claimed in claim 35 further including the step of: interpolating the lines found in step (e) to obtain the actual currents to achieve the desired output frequencies of the device and sampling the wavelength along the continuous lines prior to the interpolation.

38. (previously presented): The method as claimed in claim 35 further comprising the steps of:

coupling a portion of the laser light through a high finesse filter onto a photodiode, the high finesse filter being configured such that the peaks in its transmitivity are located at desired calibration frequencies of the laser, and

scanning the laser across each of the lines found in step (e) while monitoring the output of a photodiode, and wherein the presence of a detected output of the photodiode indicating light is

present at the output of the filter is indicative that the laser is at a required frequency for the calibration, the currents on the laser for those required frequencies being recordable so as to provide for a generation of a lookup table for the laser.

39. (previously presented): The method as claimed in claim 35 wherein if output power control is desired, any of the steps (a)-(e) are repeated for different gain currents, and the final points obtained are interpolated to find a desired output power for each output frequency.

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